

# Chapter 1

- ① Geology - the study of the Earth and the processes that shape it

Physical Geology - materials, features, changes and processes that do the changing

- ② Reasons to study Geol. - interest in world around you  
- understand / predict hazardous events  
- learn how to find resource

Draws from many other sciences

- physics, chem, bio, math, geog, astr
- but distinctive in that it focusses all these approaches on the study of ⊕

Special complexities when studying ⊕

↑  
Earth symbol

- time and scale
  - processes very slow on human scale
  - systems too large to duplicate in lab
- complexity in natural systems
  - impurities, types mixed, T/P changes, ..
  - rocks all changed many times

Scientific Method:

observe  
hypothesis  
predict  
experiment  
to test hyp.

different for geol:

} same

difficult to experiment,  
just do more observing

## ③ Uniformitarianism

- James Hutton - continuous / gradual
- "the present is the key to the past"
- by studying processes now we can understand what  $\oplus$  was like in the past (not nec. at the same rate tho!)
- i.e. coral lives in sea now so did in past too
- i.e. similar body parts today probably had the same function in the past
- the past was different though
  - $\oplus$  hotter  $\rightarrow$  more plate tect., etc
  - atm less  $O_2 \rightarrow$  diff erosion rates

## Catastrophism

- George Cuvier
- series of immense, worldwide upheavals are agents of change and  $\oplus$  static btwn

We believe in a combination of uniformitarianism with some catastrophes thrown in  
i.e. plate tectonics - gradual plate movement but stuck along edges leading to catastrophic  $\oplus$ quakes

## Dynamic Equilibrium

- as internal forces push up, gravity and erosion pull / tear down

## D. Earth is a closed system

- the amount of matter on  $\oplus$  is fixed
- we could run out of resources or space
- we keep in our pollution and garbage
- so, it is important to learn about and take care of our planet!

~~Please do Ch 1 questions # 1-6 on page 13~~

## E. How it all began

Big Bang - 14 billion years ago, everything  
crammed into size of pinhead then  
exploded; still expanding today  
= formation of universe

(universe)

Nebular Theory - cloud of dust and gas, rotating  
started to collapse, formed sun at center  
and rest became planets in orbit.

(solar system)

- high T materials condensed closest to sun
- low T materials (gas on Earth) blown out by solar energy and condensed to form outer planets (gas giants)

Earth was a molten ball initially til cooled.  
Would be completely cooled now except for  
radioactive materials inside keeping us hot.